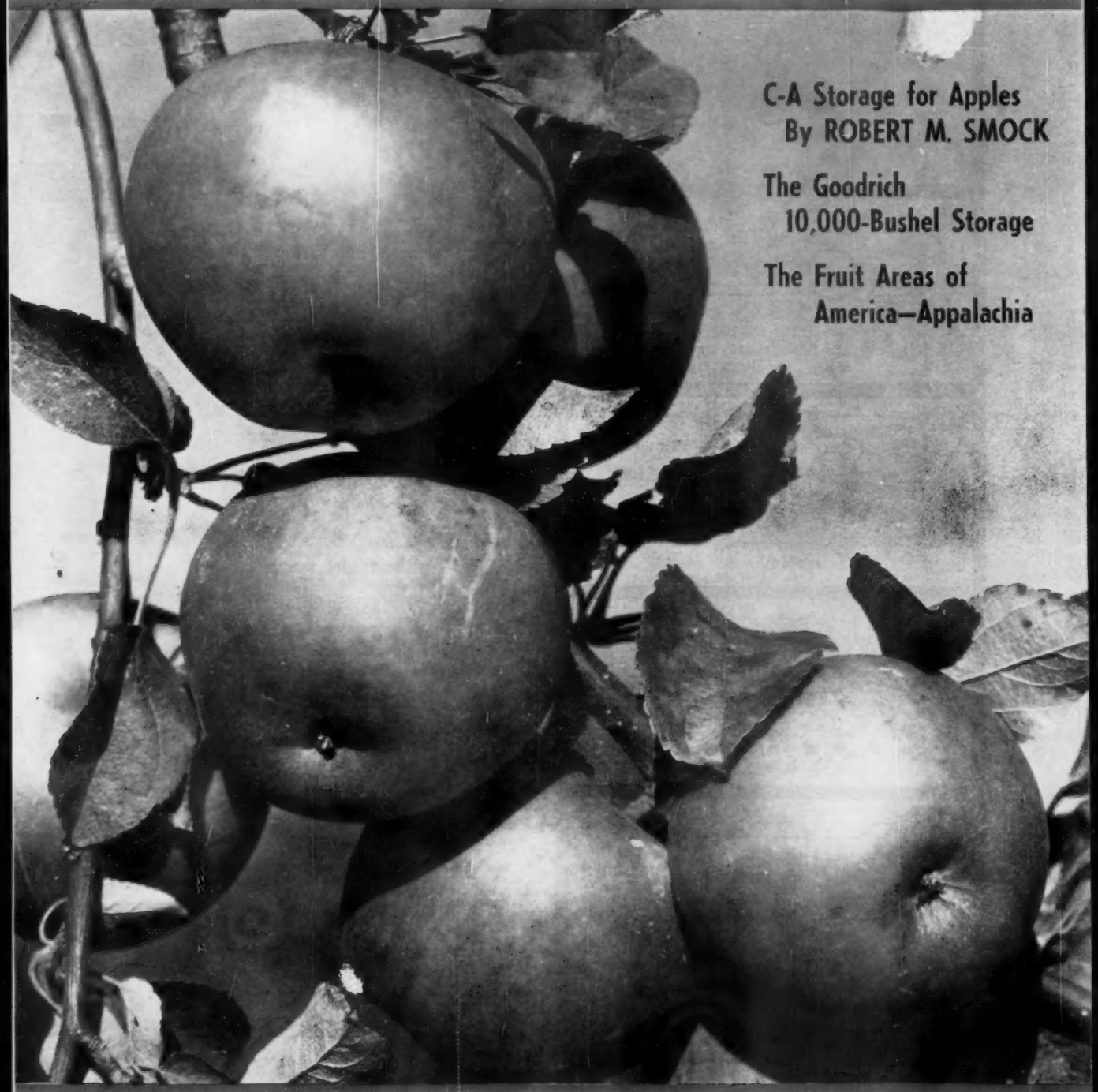
WESTERN EDITION
NOVEMBER • 1956

American Fruit Grower

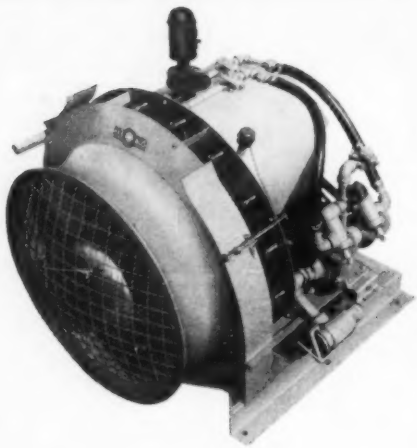


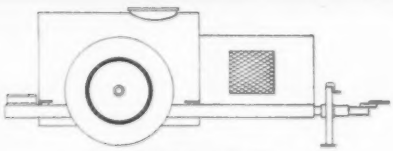
C-A Storage for Apples
By ROBERT M. SMOCK

The Goodrich
10,000-Bushel Storage

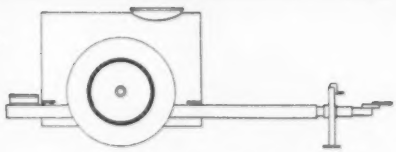
The Fruit Areas of
America—Appalachia

• STORAGE ISSUE •

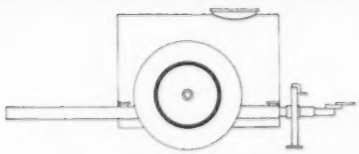




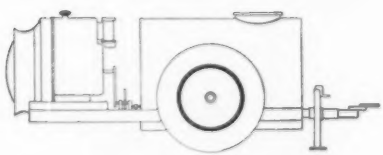
Your old sprayer – with worn-out engine and pump, or power take-off.



Remove worn-out engine and pump.



Relocate tank for better balance.



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American Fruit Grower

REG. U. S. PAT. OFF.

The Only National Fruit Publication

Vol. 76 NOVEMBER, 1956 No. 11

FEATURED IN THIS ISSUE

Cover photograph showing a cluster of apples is by J. C. Allen and Son. The commercial apple crop in the U. S. for 1956, estimated at 95 million bushels, is about 11% less than last year.

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LETTERS
TO THE EDITOR

Cider Most Popular Drink

Dear Editor:

I find in my business that the cider business is a growing thing and that the public will buy and consume in large quantities any pure fruit drink. They are becoming conscious of the fact that no pop or man-made flavored drink can compare with God's own flavor in the natural fruit. They are also becoming more health conscious and prefer the natural drink. I think American fruit growers are missing a big bet in not taking advantage of this situation to a greater degree than they have. I sell all kinds of cold drinks, pop, and cider. My cider sales, by independent public choice, are 500 times greater than the pop.

Spring Hill, Tenn. Erskine H. Early

Warning About Lime Sulfur

Dear Editor:

Last year I read in your publication about painting the trunks of apple trees with lime sulfur to keep mice from eating the bark. I put it on young one-year-old trees, apple and crab apple, and it killed 90% of them.

My son put it on a 14-year-old Jonathan tree with no apparent harm.

I thought it might be well to warn other growers before somebody else got into trouble.

Fennville, Mich. Walter W. Wightman
Wightman Farms

The short article, "Bunnies Pass Up Painted Trees," that appeared in our November, 1955, issue told how Frank Willis, Sr., of Lawton, Mich., painted lime sulfur on young peach trees and said that he planned to try it on apple trees. Reader Wightman's letter relates the first injury we have heard from this type of treatment. —Ed.

Peach Promotion

Dear Editor:

We are looking for possibilities in peach promotion and the Peach Royal (editorial in AMERICAN FRUIT GROWER, October, 1955) seems to be a very fine prospect. May I congratulate you on your efforts in promoting the peach and if you have any further suggestions in this respect, I would be pleased to hear from you.

Carbondale, Ill. Harold J. Hartley
National Peach Council

Dutch Boy Wants Work

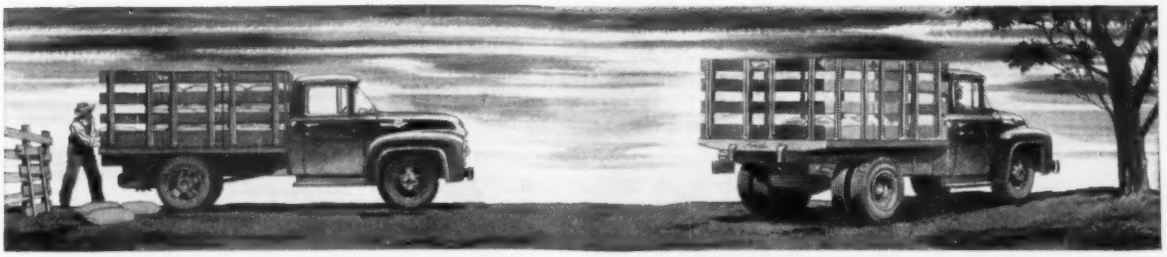
Dear Editor:

My name is Ted Gombert, of Hoeve Westrik, Hilvarenbeek, Holland, and I am 24 years old. I work on my father's fruit farm with much pleasure but I also have a brother and there is room for only one here. I want very much to go to the United States to work on a fruit farm. In 1950 I finished high school.

In Holland when we want to go to the States we must have a sponsor and it is very difficult to get one. Now, I ask if you know somebody who wants a worker on a fruit farm. I am accustomed to work hard as my father taught us.

Hilvarenbeek, Holland Ted Gombert

We suggest that fruit growers interested in our reader from Holland write directly to him at the above address for further information.—Ed.



AT WORK, 5:30 A.M. Rouse out your Ford and let it show you how it can earn its keep. No need to pamper it either; a 10-million-truck study shows Ford Trucks last longer than any other leading make.

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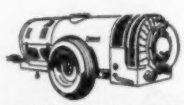
Hardie Duo-Fan Model DF-24B —Two, 24" axial flow fans.



Hardie Duo-Fan Model DF-26B —Two, 26" axial flow fans.

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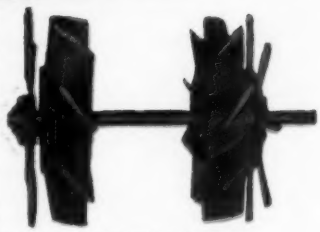

- Hardie patented two-fan assembly. Two, 40 inch axial flow fans mounted with blades opposed on a single shaft, delivering 80,000 CFM plus. Approximately 30% more air volume than a conventional single 40" fan. Covers more acres per hour than any other make of sprayer.
- 36 nozzles—18 on each side—for discharge on either or BOTH sides. Each nozzle can be easily and quickly adjusted **in the field** for any desired spray pattern. Nozzle tip sizes easily changed **in the field**
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American Fruit Grower
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Photos by John Staby

Fork-lift handling of crates from trailer to storage on the farm of John Goodrich, Burt, N.Y.

With my own COLD STORAGE everything's under my finger!

Two years after he built his on-the-farm cold storage, New York grower John Goodrich sums up his experiences

By JOHN GOODRICH

BEFORE building my farm cold storage two years ago, I had listed about 20 reasons why I should build it. These included such factors as the savings on expensive trucking to and from a commercial storage, more efficient roadside marketing, better prevention of scald, better control of mouse damage, quicker cooling, better control of bruising, lower actual storage costs, and many others. Now after two years of operation, how have my plans worked out?

I believe I have cut my storage bill in half, counting every possible cost, including the DIRTI five: depreciation, interest on investment, repairs, taxes and insurance. The electric bill ran 5 or 6 cents per bushel for the season. I helped my neighbors out a little during the peach seasons, and the return from this helped reduce costs a little.

One of the greatest savings has been the cost of hauling back and forth to commercial storages. Savings of 10 to 25 cents per bushel must have accrued from this source alone, depending upon waits, distances, and whether or not full loads could be hauled. Of course I had some handling and stacking expense, but this was cut to a minimum by the use of fork-lift truck and pallets.

A big advantage of having my own storage close to my packing room is that of packing during periods of warm, moist weather when apples "sweat" rapidly. By handling only a pallet at a time, we can usually grade and pack apples before they get too wet. When hauling from storages by the truckload, it was impossible to pack on many days because of smearing the wet fruit.

In each of the past two seasons, storing peaches and pears for short periods has increased my roadside market profits. Early peaches ripen very fast during periods of hot

(*Continued on page 29*)

Clark Trucloader stacks pallets of apples inside Goodrich cold storage. Storage was designed for pallet handling with lift truck; for example, there are no inside posts. Redwood siding is shown at rear; also Carrier refrigeration unit and piping.

Standing outside the controlled atmosphere apple storage compartment in his cold storage room, John Hall, Niagara County, N.Y., fruit grower, looks through the window to read—and record—the temperature inside the compartment. From time to time the air is passed through a washing machine (rear) to remove excess carbon dioxide. Hall was one of the first commercial growers in the United States to install a CA apple storage.

USDA Photograph by Knell

CONTROLLED ATMOSPHERE STORAGE OF APPLES

Ten years from now commercial growers will store almost all their apples for late market in CA storages—here's why

By **ROBERT M. SMOCK**
Cornell University

OVER 800,000 boxes of apples were held in controlled atmosphere storages last season by New York and New England growers. This year, with several new storages just completed, the number is expected to top a million.

Most of the capacity last year was McIntosh, but several rooms held Delicious, Golden Delicious, and Rome Beauty. These apples were held in good condition until April, May, and June, when they commanded good premium "late market" prices.

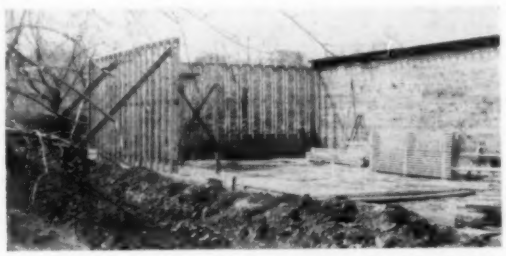
Controlled atmosphere storage—or CA storage as it is commonly called—involves storing fruit in refrigerated, gastight rooms under low oxygen and high carbon dioxide atmospheres.

How does it work?—Suppose we are storing McIntosh in 5% carbon dioxide and 3% oxygen at 38° F. Prime maturity apples are placed in the storage at 32° F. The room is filled in 10 to 14 days and the gastight door is sealed. The temperature is now allowed to rise to 38° F.

Gas analyses are started the day after the sealing and continued twice daily until the room is opened. Since the apples are alive and respiring, the oxygen begins to come down from the normal of 21% in air. If nothing were done about it, the oxygen level would go down to zero in two to three weeks in a well-constructed room. As this would result in ruination of the fruit, outside air is blown into the room daily as required to keep the oxygen up to 3%.

All the while this has been going on, the carbon dioxide has been going up. McIntosh cannot tolerate more than 5% carbon dioxide for more than short periods of time, so the excesses of carbon dioxide must be "scrubbed" out of the atmosphere. This is done by washing the atmosphere in a spray of caustic soda (sodium hydroxide) solution.

What's good about it?—Since controlled atmospheres slow down the respiration rate or living rate of the apples, they keep longer. For example, McIntosh apples kept in 31-32° F. air in regular storage should



A new CA storage room going up at Pat Russo's orchard, Highland, N.Y. This 12,500-box room of frame construction with ground cork is the fourth one Russo has built.

be sold by February or no later than March 1. CA McIntosh can be kept in excellent condition until April, May, and June.

The shelf life of apples coming out of CA storage is extended. On the basis of firmness as measured by the pressure tester, apples coming out of storage in May might be expected to have a shelf life of seven days. Instead, they have a shelf life of two to three weeks if they are not allowed to shrivel. This is what we call a "residual effect of storage." The apples don't quite recover from the long storage treatment in low oxygen atmospheres.

Low temperature disorders can be avoided without sacrificing length of storage life. For example, McIntosh stored in CA at 38° F. escape the brown core disease that comes at 32° F. and the apples keep much longer than apples held in air at 32° F. The same is true of soft scald on Jonathan and Golden Delicious, internal browning on Yellow Newtown, etc.

Certain other diseases are lessened if not controlled. Jonathan Spot and Spy Spot are usually well-controlled in CA storage. Decay does not develop as rapidly as in regular storage.

On certain varieties such as Rome Beauty, storage in 2 to 3% carbon dioxide and 3% oxygen at 32° F. is one of the best scald control methods we now have. On other varieties scald is reduced but not controlled. For example, in a study of McIntosh from 17 orchards during the past season we found an average of 45% scald in regular storage and 16% in CA storage.

Another advantage is that no mice and rats can survive in such a storage.

What's bad about it? The rooms cannot be freely entered. You cannot take out 3000 boxes for December sale and seal the room back up again. If a motor burns out, you have to put an air mask on to go into the room.

You are speculating on a high price in the spring. This may or may not come. It is possible for apples to bring more money in the fall than they do in May, although so far, in our New York experience this has not happened.

There is a lot of worry and work. If the room is not gastight, it will not work. (Tests for gastightness are available, however.) You can only inspect fruits by the porthole in the door. Gas analyses and operation of the scrubber will take approximately one hour a day for each 10,000-box room.

Details of operating a controlled atmosphere storage can be obtained by writing to Dr. Robert M. Smock, Cornell University, Ithaca, N.Y., for the "Handbook of CA Operation."

What does it cost?—The necessity of making the room gastight with a metal lining on walls and ceiling and a gas seal in the floor makes construction more expensive. You can figure that if it costs $2.00 to complete a 10,000-box regular storage, it will cost $2.50 to $2.75 for CA storage at present costs.

A scrubbing device of some sort is necessary. Caustic soda must be bought for the scrubber. Air purification with activated carbon is a "must" to keep down foul odors and to help reduce the scald level. Operating costs are higher because of the necessity of gas analyses and operation of the scrubbers.

A recent survey by Dana Dalrymple, of Cornell, on New York CA rooms indicates that it cost from 40 to 60 cents (total costs) per box. Space rental in New York is usually 65 to 70 cents per box for the season.

On what varieties does it work?—An evaluation of the atmosphere-temperature requirement for a particular variety usually requires five years. For example, we thought we had an ideal combination for Northern Spy for three years, but in the fourth year the apples could not tolerate the carbon dioxide level we had suggested at 32° F. Some of these requirements are still being worked on.

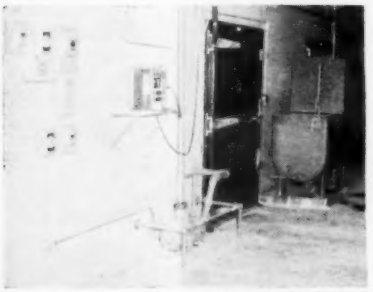
Dr. Don Dewey at Michigan State is exploring the requirements for Jonathan. Dr. G. E. Mattus at Virginia is working on Stayman and Rome requirements. Workers in California have worked on the requirements for Yellow Newtown in that state.

How big are the rooms?—We cannot see any reason why a properly engineered CA room could not be 50,000-box capacity or more. Other factors limit the size of the rooms. An individual room should be filled and sealed in 10 to 14 days. An operator might want to open one room March 1 for sale during that month and a second room in April, etc.

Actual experience in New York

(*Continued on page* 20)

Dr. Smock removes apples from one of three controlled atmosphere rooms in Cornell University's modern cold storage completed in 1954. Room is sealed by an aluminum-faced door on the inside of the insulated door and cannot be entered until final removal of apples in the spring. Porthole in door facilitates inspection of apple condition.



Exterior of 48,000-box controlled atmosphere storage at Red Hook Cold Storage, Red Hook, N.Y. (top photo). The unloading platforms are at rear of building. The control room is shown above. Gas analyzer is at left; tank for making up caustic soda solution is at right of door.

THE FRUIT AREAS OF AMERICA

APPALACHIA

The Land Beyond

By **CARROLL R. MILLER** *Appalachian Apple Service, Inc.*

This is the ninth in a series of articles on important Fruit Areas of America. Previous "fruit tours" have taken us to New Jersey; East of the Cascades in Washington; California's Central Valley; the Ozark region of Missouri, Arkansas, and Oklahoma; New England; the Lower Rio Grande Valley of Texas; Western New York, and Georgia.—Ed.

BY the evidence I prefer, the American apple industry started in Appalachia—"the land beyond" of the Indian tribesmen. There is evidence that Capt. John Smith and his 1607 Jamestown excursionists first brought over European apples or scions. In 1897, W. A. Taylor, of the USDA, wrote:

Certain it is that in 1647 the apple is recorded as grafted upon wild stocks in Virginia, while in 1686 William Fitzhugh, in describing his own plantation, mentions "a large orchard of about 2500 apple trees, most grafted, well fenced with a locust fence."

George Washington fathered, in addition to his country, a whole section of the Appalachian apple industry. As a boy surveyor, and later Virginia's chief Indian fighter, he knew many of the fat valleys in the wild Alleghenies to the west. When the revolution was over, the Continental Congress paid off its soldiers in part with grants of land in this untamed area. George Washington bought many of these grants. Leasing these later, Washington had a standard form, still in existence, stipulating that "..... acres be planted to apples and kept fenced and in good tilth."

A considerable apple industry grew up in the early 1800s along the Ohio River, then part of Virginia. The river men loaded apples on flatboats hewn from Virginia white oak and floated them down the Ohio into the Mississippi and on to Mobile and New Orleans.

The Civil War ended the flatboating; but the apple industry was budding in other parts of Appalachia. Probably the following was happening at different places about this time, as new things have a way of doing, but this bit of family history will illustrate. My grandfather, William S. Miller, on his farm on Apple Pie Ridge near Martinsburg, liked growing fruit much better than the usual corn-wheat-hay rotation. The farm cider mill stood on a southern slope just above the hog pen, and the apple seeds from the mill grew tremendously in the warm sunshine plus.

Grandfather wrote nursery men of Philadelphia and New York state for instructions on budding and grafting, for there were in those days neither county agents nor horticulturists. He soon had a nursery, just about 100 years ago, in the early 1850's. The Civil War disrupted traffic in the whips, so Grandfather planted them on his own acres. A few years later (around 1870) a New York buyer paid him $6000 "on the barrel head" for his apple crop—a lot of money for a farm crop in those days. The big landowners of the surrounding coun-

Unloading apples at an Appalachian processing plant (above). About half the Belt's crop (average size: 20 million bushels) goes for processing, and the world's biggest apple processing plants are located here. The Belt's processors put up about 60 per cent of the U.S. pack of apple sauce and slices. The larger plants, such as the one at right, employ up to 900 people in double shifts during peak of season, September to December.

Appalachia is the land of big orchards. Many seem to cover whole mountainsides (above left). One-fourth of the Belt's orchards are under 12 years of age, so average yield per tree is only 4 bushels. Typical of these young orchards is the 10-year-old Virginia apple orchard above.

***Left*—Appalachia, as a fruit belt, covers four states: Pennsylvania, Maryland, Virginia, and West Virginia. Virginia grows about 45% of the Belt's apples (9 million bushels), Pennsylvania about 6 million, West Virginia 3.6 million, and Maryland 1.2 million. While apples are the big crop, peaches and sour cherries are also grown.**

Tourists know Appalachia as the land of Shenandoah Apple Candy, on sale at nearly every souvenir counter and antique shop in the Belt, as well as by mail order. Shown below being weighed and packaged at the Winchester, Va., plant, sales total more than 200,000 pounds annually.

ties came and stayed while Grandfather happily demonstrated his practices with apples and peaches. Then they went home to plant their own orchards.

The Appalachian fruit belt now stretches some 600 miles southwest from Allentown, Pa., to below Roanoke, Va. Commercial orchards are scattered generally over the four states—the two Virginias, Maryland, and Pennsylvania. A compact group of seven counties at the center of the Belt produces about half of Appalachia's fruit: Frederick and Clarke in northern Virginia; Berkeley and Jefferson in West Virginia's eastern Panhandle; Washington in western Maryland; and Adams and Franklin in Pennsylvania.

The 1955 U. S. Agricultural Census reports that in the five-year period, 1949-1954, the apple tree census of the four states dropped 22%. The decline started years before that. In 1920 there were 21½ million apple trees in the Belt; 8½ million in 1950, a 60% reduction.

But more and bigger apples keep coming. Virginia in 1954—a big crop year—produced 13 million bushels of apples, one of her all-time highs.

There is a solid base for commercial fruit growing in the Appalachian Belt. It is far enough north that the apple trees get the necessary dormant "rest period" and far enough south that the Belt's apples mature first—no mean advantage in marketing. There is rainfall enough (usually) to bring the crop through, yet moisture is light enough so that scab, while a real problem, is not so serious as in the more humid northeastern states.

The Belt is in the center of the East Central states with their huge population; and is near the South, which must import apples. Labor is perhaps one-fourth cheaper than farther north. The foothills and ridges of the Allegheny and Blue

(*Continued on page 26*)

State NEWS

- **Industry Gobbles Niagara Peninsula Fruitland**
- **Tennessee Freeze-out Last Year Results in Insect-free Crop in 1956**

Loss of Fruit Lands

CANADA—The rich Niagara Peninsula fruit belt in southern Ontario, where 60% of Canada's fruit has been produced, is becoming industrialized. About one-quarter of the belt already has been sold for new subdivisions and factory sites, and the balance of 60,000 acres is going at a rate of 2000 acres a year.

A joint municipal-government study shows the "situation is serious," states Dr. E. F. Palmer, director of Ontario's horticultural experiment station at Vineland. Dr. Palmer adds hopefully that he believes the problem is not beyond solution, that if there is sufficient planning it will be possible to retain a good portion of this fertile area for fruit and vegetable production.

Ontario has led British Columbia as a tree fruit producer but this loss of fruit lands in the Niagara Peninsula is expected to put British Columbia in the lead.

Small but Good!

IOWA—Total production of apples for the state was considerably below average. The small crop was due, grower reports indicate, to lack of moisture, freeze damage at blooming time, over production in 1955 (this being the "off" year), and in some cases lack of nutrients. Size and quality of the fruit, however, were excellent.—*Glenn Raines, Sec'y, Des Moines.*

No Letdown!

TENNESSEE—Last year's crippling freeze-out of a fruit crop and the rest the trees obtained as a result, were contributing factors to this year's excellent, insect-free fruit crop. (Unsprayed peach and apple trees in home orchards were reported almost free of pests.) Growing conditions were favorable although some orchards suffered hail damage, and drought conditions in the western part of the state in late summer hurt size and quality of late apples.

This season's excellent results should be considered abnormal and not as evidence for relaxing of normal, even rigid, pest control practices.—*A. N. Pratt, Sec'y, Nashville.*

Researcher, Teacher Retires

MISSOURI—Dr. A. E. Murneek, of the department of horticulture, University of Missouri, has retired from his research and teaching career, after 31 years.

Dr. Murneek's fundamental research in the physiology of fruits won him international acclaim and his bulletins on fruit production problems are standard handbooks in every Missouri orchard.

The Murneeks will make their home in Portland, Ore., where they met during college days and where they were married.—*W. R. Martin, Jr., Sec'y, Columbia.*

Magnesium Deficiency

NEW JERSEY—Harvest of the apple crop is moving slowly, with growers concerned about getting the apples off the trees. The fruit is highly colored with very fine finish and the over-all crop—estimated at 2½ million bushels—better than first anticipated.

Magnesium deficiency in several orchards, mainly on Golden Delicious, Rome, and Baldwin, will necessitate applying magnesium this fall or spring.

The peach crop was excellent, with the market generally good. The M. A. Blake variety competed with Elberta and was preferred by buyers because of its fine color, quality, and firmness.—*Ernest G. Christ, Sec'y, New Brunswick.*

PUBLIC RELATIONS—hic'—DIDN'T WORK!
Officials of the Ontario (Canada) Peach Growers Marketing Board are still red-faced over their recent public relations effort. Booklets were distributed to delegates to the annual conference of the Ontario Women's Temperance Union listing peach recipes. Among the recipes was one for "tangy peach treats" that directed the "peaches stand in your favorite wine until thoroughly penetrated." Adding insult to injury was the suggestion, "experiment with different wines."—George E. Tales

Peaches in October

ALABAMA—Fresh peaches in October!

Horticulturists at Alabama Polytechnic Institute's experiment station at Auburn harvested this year an average of about 4 bushels of peaches per tree from four new unusually late peaches they have been testing since 1952.

These late peaches, similar in size and color, are Rodeo, Late Rio, and two unnamed varieties numbered C-14-103 and C-22-7. They originated in California and were introduced commercially by Grant Merrill, Red Bluff, Calif., grower and breeder. The new varieties ripen from five and one-half to seven weeks later than Elberta and will hang ripe on trees for at least two weeks, say station horticulturists.

Hardiness of buds during below-freezing temperatures in late spring is one of their outstanding qualities, they report.

Alabama at present does not produce any fresh peaches later than mid-August.

(*Continued on page* 28)

FRUIT PEST HANDBOOK

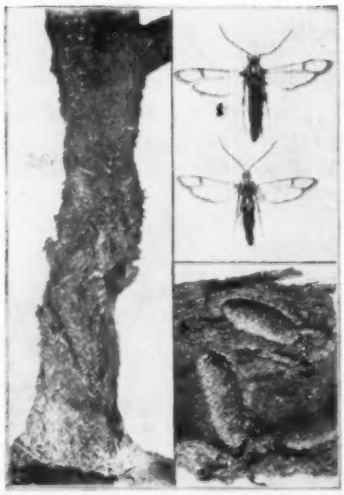
(FIFTY-FOURTH OF A SERIES)

LESSER PEACH TREE BORER

THE lesser peach tree borer is a common pest of peach and other stone fruits throughout the United States, except in the Far West. Injury is similar to that of the peach tree borer, except it occurs above the ground line and is due to the feeding of the larvae in the inner bark of the trunk, crotches, and scaffold limbs, particularly in injured and roughened areas. A gummy exudation containing brown, sawdust-like castings at such points is evidence of infestation. The larvae are white with brownish heads.

The insect overwinters as a partly grown larva in infested areas on the trees. The larvae become active early in the spring and the moths emerge in April and May in the South, and from the middle of May or early in June to August in the North. The adults are clear-winged moths with pale yellow markings on the abdomen. The eggs are laid in cracks and crevices in the bark. A second generation appears in August and September in the South and a partial second generation appears late in August and early in September in the North.

Control. **Spray the trunks and larger limbs thoroughly with 2 or 3 pounds of 15% parathion or 1½ pounds of 25% EPN wettable powder per 100 gallons. In the North, make the first application about June 10-15 and make three additional applications at three-week intervals. In the South, better results may be obtained if the first application is made when moths appear in April, the second about a month later, the third when moths appear in August, and the fourth about a month later. In small home orchards do not use parathion or EPN. Use 2 or 3 pounds of 25% malathion wettable powder per 100 gallons of spray. Follow all precautions on the label for using the recommended insecticide. Do not use parathion or EPN within 14 or 15 days of harvest nor malathion within seven days of harvest time.**



Photos show injury to trunk of peach tree by lesser peach tree borer, peach tree borer adults (top, right), and cocoons. *Courtesy USDA.*

If the recommended insecticides are used for controlling the plum curculio and peach tree borer, it should not be necessary to make special application for the lesser peach tree borer.—*Howard Baker, USDA.*

CALENDAR OF COMING MEETINGS & EXHIBITS

Nov. 7-8—Wisconsin State Horticultural Society and Wisconsin Apple Institute joint annual convention, Retlaw Hotel, Fond du Lac.—H. J. Rahmlow, Sec'y, U. of Wisconsin, Madison 6.

Nov. 7-9—Florida State Horticultural Society annual meeting, Orlando.—E. L. Spencer, Sec'y., Box 678, Manatee Sta., Bradenton.

Nov. 14-16—Iowa Fruit Growers Association annual meeting and fruit show, Ames.—R. Glenn Raines, Sec'y, State House, Des Moines.

Nov. 17-18—Student horticulture show, Oklahoma A & M College, Stillwater.—Fred LeCrone, Oklahoma A & M College, Stillwater.

Nov. 19-20—Ohio Pesticide Insutitute, Inc., annual meeting, Neil House, Columbus.—J. D. Wilson, Sec'y, Ohio Experiment Station, Wooster.

Nov. 26-28—Illinois State Horticultural Society and Illinois Fruit Council annual meeting, Abraham Lincoln Hotel, Springfield.—Harold J. Hartley, Sec'y, Carbondale.

Dec. 3-5—New Jersey State Horticultural Society annual meeting, Atlantic City.—Ernest G. Christ, Sec'y, New Brunswick.

Dec. 3-5—Kentucky State Horticultural Society 100th anniversary meeting, with American Pomological Society co-operating, Brown Hotel, Louisville.—W. W. Magill, Sec'y, U. of Kentucky, Lexington.

Dec. 4-5—Oklahoma Pecan Growers Association annual show and convention, Ardmore.—E. L. Whitehead, Sec'y-Treas., Stillwater.

Dec. 4-6—Michigan State Horticultural Society annual meeting, Civic Auditorium, Grand Rapids.—A. E. Mitchell, Asst. Sec'y, Michigan State U., East Lansing.

Dec. 6-7—Tennessee State Horticultural Society 51st annual convention, Andrew Jackson Hotel, Nashville.—A. N. Pratt, Sec'y, 403 State Office Bldg., Nashville.

Dec. 6-7—Oregon State Horticultural Society 71st annual meeting, Oregon State College, Corvallis.—C. O. Rawlings, Sec'y, Corvallis.

Dec. 7—Tennessee Pesticide Institute organization meeting, Andrew Jackson Hotel, Nashville.—A. N. Pratt, 403 State Office Bldg., Nashville.

Dec. 7-8—Idaho State Horticultural Society 62nd annual meeting, Hotel Boise, Boise.—Anton Horn, Sec'y-Treas., Boise.

Dec. 10-12—Washington State Horticultural Association 52nd annual meeting, Yakima.—John C. Snyder, Sec'y, Pullman.

Dec. 11-12—Connecticut Pomological Society 66th annual meeting, Hotel Bond, Hartford.—Sherman P. Hollister, Sec'y, Storrs.

Dec. 11-12—Peninsula Horticultural Society annual meeting, Capitol Grange Hall, Dover, Del.—Robert F. Stevens, Sec'y, Newark.

Dec. 13-14—Kansas State Horticultural Society annual meeting, Manhattan.—W. G. Amstein, Sec'y, Manhattan.

Dec. 14-15—Western Colorado Horticultural Society annual meeting, Mesa College, Grand Junction.—Raleigh B. Flanders, Sec'y, Box 478, Grand Junction.

Dec. 14-15—Utah State Horticultural Society annual convention, Hotel Utah, Salt Lake City.—Anson Call, Sec'y, Logan.

Jan. 3-4, 1957—Maryland State Horticultural Society annual winter meeting, Hotel Alexander, Hagerstown.—A. F. Vierheller, Sec'y, College Park.

Jan. 8-9—North Carolina State Apple Growers Association, annual meeting, Hendersonville.—Melvin H. Kolbe, U. of North Carolina, Raleigh.

Jan. 8-10—Massachusetts Fruit Growers' Association annual meeting, Worcester—A. P. French, Sec'y, Amherst.

Jan. 10-12—Northeastern Weed Control Conference, 11th annual meeting, Sheraton-McAlpin Hotel, New York City.—E. M. Rahn, Chairman, Public Relations Committee, Dept. of Hort., Newark, Del.

Jan. 14-16—Virginia State Horticultural Society 61st annual meeting.—John Watson, Sec'y, P. O. Box 718, Staunton.

Jan. 21-26—New Jersey Farmers Week, Trenton.—Fred W. Jackson, Dir., Div. of Information, Dept. of Agriculture, Trenton 25.

Jan. 22-24—Indiana Horticultural Society 96th annual meeting, Severin Hotel, Indianapolis.—George A. Adrian, RR 4, Box 54-M, Indianapolis.

New York State Horticultural Society winter meetings: **Jan. 23-25**—Rochester; **Jan. 30-Feb. 1**—Kingston.—D. M. Dalrymple, Sec'y, Lockport.

Jan. 28-30—Pennsylvania State Horticultural Association annual meeting, Yorktowne Hotel, York.—John U. Ruef, Sec'y, University Park.

THE QUESTION BOX

Don't be perplexed! Send us your questions—no matter how big or small. A three-cent stamp will bring you an early reply. Address: The Question Box, AMERICAN FRUIT GROWER, Willoughby, Ohio.

FRUIT STORAGE

Where can I obtain information on storing fruits?—*West Virginia.*

The USDA publishes a bulletin, "Home Storage of Vegetables and Fruits." Ask for Cat. No. A 1.9:1939 and include 10 cents. Direct your request to Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Also, Cornell University publishes "The Storage of Apples," Bul. E440, which is available for 5 cents; "Controlled Atmosphere Storage," Bul. E759, available for 10 cents; and "Farm Refrigerated Apple Storage," Bul. E786, available for 25 cents. Address your request to the Mailing Room, New York State College of Agriculture, Ithaca, N. Y.

DWARF APPLE TREES

I would like to try a small orchard of dwarf apple trees but don't know the best rootstocks and varieties for my area. Could you advise me? —*Oklahoma.*

There are several rootstocks used for dwarfing apple trees but Malling VII, which produces a semi-dwarf tree, is probably the best. Malling IX is the most dwarfing stock but does not survive well under high summer temperatures. There are several different varieties propagated on Malling VII rootstock. Oklahoma A & M Collge recommends Lodi, Summer Champion, Turley, and Starking as the best varieties for our reader's locality.

IDENTIFYING APPLE VARIETIES

What can I use as a guide for identifying apple varieties?—*Michigan.*

Obtain a copy of Hedrick's "Systematic Pomology" published by MacMillan Co., 1925. The book has information on identifying varieties of deciduous fruits and berries. Keys help in identification by listing characteristics such as shape, period of ripening, color of flesh, etc. The inexperienced will find the keys rather difficult to use correctly but will gain considerable new knowledge on how to go about identifying varieties. Copies are scarce but second-hand book stores should be able to supply you.

NUT VARIETIES

We plan to set out an acreage of nut trees, preferably pecan, English walnut, and almond. What varieties do you recommend?—*Maryland*

Almonds cannot be produced consistently under conditions prevailing in your section. The almond tree blossoms so early that frost almost always destroys them in your locality.

The northern varieties of pecan, such as Major, Busseron, or Indiana, are recommended. N. L. Crane, nut tree specialist with the USDA, reports that the southern variety Moore might successfully mature a crop for you.

The Persian or English walnut varieties that come from the Carpathian Mountains of Poland or Russia would be the best ones to plant, such as Broadview, Metcalf, Schafer, or Littlepage. The Carpathian line of walnuts is quite hardy. The trees, however, start growth early in the spring and should be planted on slopes or ridges of rolling land where good air drainage prevails so that they may escape injury from late spring frosts.

"At Sunkist, we're sold on polyethylene. And so are our customers. When it comes to citrus fruit, people prefer products packaged in polyethylene."

Sunkist Growers find polyethylene

"ideal for packaging whole citrus fruit"

Hear the facts from Robert Clark, assistant manager, Dealer Service Division of Sunkist Growers, Inc., Los Angeles, Cal.

"Polyethylene packaging has increased the size of the average consumer purchase of oranges by 25% to 35% . . . and we anticipate lemons will show a 50% increase. It is the one material which provides an attractive package through which the fruit is visible, a readily printable surface, and a strong and durable bag . . . and all this at a cost lower than any comparable material available today."

You can find the same advantages for other fruits and produce with packaging in film made of BAKELITE Brand Polyethylene. Check the facts with your packaging supplier.

It pays to package in film made of

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CONTROLLED ATMOSPHERE STORAGE

(*Continued from page* 13)

has shown that rooms of 10,000- to 15,000-box capacity work best from a commercial handling standpoint. Some of our operators have five or six such rooms. The largest single operations run around 65,000 boxes total capacity.

Will sealed film liners replace it?—The success of sealed polyethylene box liners with pears has caused many people to ask if they would not replace CA storage. Polyethylene is an unusual film in that it is more permeable to carbon dioxide than to oxygen. It is theoretically possible to get an atmosphere of 5% carbon dioxide and 3 to 5% oxygen in a sealed liner of McIntosh. In occasional instances we have found such atmospheres.

Actual analyses in such liners in our experiments have shown oxygen levels ranging from 5% to 20%, however. The liners must be truly gastight to get a level of oxygen as low as 5%. We have found that many of our sealed liners were "leakers." In some instances we had off-flavored fruit and excessive carbon dioxide injury both externally and internally in the fruit. The inherent weakness in using such liners for apples is that there is not control of the atmosphere. Witness the fact that in CA room operation we analyze the atmosphere and adjust it twice daily.

In special instances sealed box liners may be good enough to fill the role played by CA storage. It has proved itself in most cases with pears. Ryall and Uota working in California have had very good luck with Yellow Newtown apples.

What is its future?—Last year's experience in New York and New England illustrates the present position of CA apples in the marketing picture. With the low prices prevailing for regular storage apples on March 1 it would have seemed that we had reached the saturation point for big premium prices for CA apples. The market did start out slowly but gradually picked up until it ended in a strong condition with good premium prices.

The industry itself should be given a great deal of credit for doing such an excellent marketing job. Money raised by the New York and New England Apple Institute informed the produce trade of these specially stored apples and resulted in sales throughout the country except for the West Coast. Shipments were even made to western Canada.

TEMPERATURE AND ATMOSPHERE REQUIREMENTS OF NEW YORK AND NEW ENGLAND APPLES IN CA STORAGE

Variety	Carbon dioxide	Oxygen	Temperature
McIntosh	2-3% one month, then 5%	3%	38° F.
Northern Spy	8%	3%	38° F.
Delicious	2%	3%	32° F.
G. Delicious	2%	3%	32° F.
Rome	2%	3%	32° F.
Stayman	5%	3%	32° F.
Baldwin	2-3%	3%	32° F.

My own philosophy on this point is as follows: There undoubtedly is a saturation point where big premium prices will disappear. On the other hand, CA storage is here to stay.

The 1955-56 marketing season was a "sick" one for regular storage. Would it not have been still worse, if 800,000 more boxes of apples (mostly McIntosh) had been offered for sale prior to March? Sound marketing calls for good supplies of high quality fruit from September until June. Controlled atmosphere storage allows us to do just that.

THE END

NEW COLD STORAGE IN MICHIGAN

This is the first section of Southern Michigan Cold Storage Company's new $1½ million storage near Benton Harbor which is equipped to handle both frozen foods and fresh fruits. The building measures 324 x 160 feet, has 16 feet of clearance inside. The refrigerating load is divided into three levels. Six freezing tunnels, operated at minus 30° F., can handle 370,000 pounds of food per day. The freezer storage, in which frozen foods are held at zero, has a capacity of 18 million pounds of palletized foodstuffs. Clark fork-lifts handle the loaded pallets. Entrance to the freezer storage is through six Jamison super-freezer doors, each equipped with automatic openers and electric defrosters. The fresh fruit storage, with capacity of 75,000 bushels, is maintained at plus 30° F. Eleven Frick ammonia compressors, with motors totaling 700 h.p., carry the refrigerating load. A 30-foot wide loading dock extends across the front of the building. Carl Steimle is president of the company and M. S. "Chief" Fuller, of Sodus, manager.

The ground-hugging, 2-3 plow "420" Utility Tractor is compact, stable, easy to handle, ideal for work in groves, orchards, berries, and vineyards.

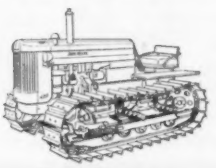
BOOST YOUR Earning Power

with a *New* JOHN DEERE *420*

You'll like the modern looks of a new John Deere "420" Utility—and you'll profit by its stepped-up Earning Power. Here's traditional John Deere simplicity in a modern, versatile, sure-footed tractor for your special needs. It handles 3-bottom plows, 6- or 8-foot disk harrows under most conditions. Matches the work output of much larger tractors on jobs such as mowing, spraying, etc. Best of all, it saves you money. The first cost is low. Fuel and maintenance economy is exceptional. There's a full line of low-cost, time- and labor-saving tools.

Only 50 inches high, the "420" Utility snugs up to trees. Has "live" Touch-o-matic hydraulic system for precision control of working tools, with 3-point hitch for rapid, easy change . . . Load-and-Depth Control for uniform work in changing ground conditions . . . deep-cushion adjustable seat . . . smooth clutching . . . standard speed PTO; also, high-speed drive. Power-adjusted rear wheels are available as optional equipment.

See your John Deere dealer soon, and ask him for a free demonstration.



THE "420" CRAWLER

Now available with heavy-duty *3-point hitch,* direction reverser, auxiliary foot throttle—and many other modern features for peak earning power. Dependable, sure-footed, low-cost, all-weather worker with 3-4 plow power for field, orchard, grove, and vineyard.

ASK ABOUT THE JOHN DEERE CREDIT PLAN

New Optional Features of "420" Tractors

- New 5-Speed Transmission—Provides an extra speed of 6-1/4 mph on wheel tractors; ideal for mowing, rotary hoeing, etc. On Crawlers, provides a new speed of 3-7/8 mph in fourth gear, and 5-3/4 mph in fifth.
- New Direction Reverser—Provides complete range of forward and reverse speeds without shifting gears. Speeds up such jobs as loading or dozing.
- New Continuous-Running PTO—Available with 5-speed transmission on wheel tractors (regular on crawler). Controlled by tractor clutch pedal. PTO continues to operate when tractor motion stops.
- New Auxiliary Foot Throttle—Provides up to 25 per cent higher transport speed, and increases speed, when needed, at any setting of the throttle.

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JOHN DEERE • Moline, Ill. • Dept. P42

Please send free literature on:

☐ "420" Utility ☐ "420" Crawler

Name _____ ☐ *Student*

R.R. _____ *Box* _____

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State _____

JOHN DEERE

"WHEREVER CROPS GROW, THERE'S A GROWING DEMAND FOR JOHN DEERE FARM EQUIPMENT"

NEW FOR YOU

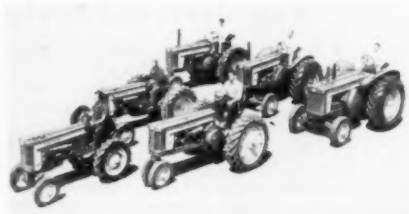
Cut Handling Costs

Now being mass-produced is an inexpensive wirebound pallet box which is being used by profit-minded growers for handling bulk fruit. Sizes range from a heavy-duty pallet box with outside cleats and a 2000-pound capacity to a lighter, 500-pound box. There is even a low-cost, expendable, one-time shipper. Write Bob Ornberg, General Box Company, Des Plaines, Ill., for details on models.

Cool Profits

One of the pioneer manufacturers of hydrocooling equipment is now making a machine that is within the reach of all profit-minded growers. After six years of field testing, Clarksville hydrocoolers are trouble-free units. Write Jack Cline, Clarksville Machine Works, Clarksville, Ark., for details.

They're All New

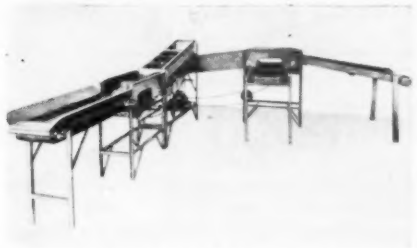


Shown above are the six power sizes in the new John Deere tractor line. The 1-2 plow 320 Series is available in standard and utility models. The 420 Series features six 2-3 plow wheel-type tractors and two 3-4 plow crawlers. The 520

- **Low-cost Pallet Boxes**
- **Rabbit Repellent**

Series are general-purpose tractors, available with gasoline or LP-Gas engines. The 4-plow 620 and 5-plow 720 Series are built in general-purpose, standard, and Hi-Crop models with gasoline or LP-Gas engines. Heavyweight of the line is the 5-6 plow 820 Series with diesel engines. Write George Neiley at Deere & Company, Moline, Ill.

Better Apple Grading



A new grader designed to meet the needs of New York growers is now available to growers everywhere. Built in 18-, 24-, and 26-inch widths, the units are furnished straight or angled. Shown above is the 18-inch model consisting of a feed belt, cull eliminator, brusher, roll sorting conveyor, sizer, and power table. The entire unit is operated by power drives for speedy grading. Depending on model size, the machines have turned out from 50 to 300 bushels per hour in actual packing house use. Write Marion Maynard at Lobee Pump & Machinery Co., Gasport, N.Y.

Protect Your Trees

How to keep hungry rabbits away from valuable trees has long puzzled growers. Reports are that a new product called Rabbit-Rap is doing the job. Made of tough, slit and expanded aluminum, it is rustproof and can be cut with ordinary scissors. Very low in price, it is easily applied and expands as the tree grows. Write K. H. Lindqust at Research Products Corp., 1015 E. Washington Ave., Madison 10, Wis.

WINDFALLS

It is said that Isaac Newton while sitting under an apple tree was struck on the head by a falling apple. Thus he conceived the great truth of his Law of Gravitation.

By HENRY BAILEY STEVENS

A Tale of Two Monuments TO orient my western pilgrimage we went first to Leominster, Mass., where Jonathan Chapman (Johnny Appleseed) was born in 1774. Some of us had encouraged the placement of a boulder at the birth site. Now with the help of a policeman we located it down a little-used road in the woods.

Rather desolate the big stone stood, still fenced within the stakes and rope of the celebration of a few years ago. But to my dismay only gaping drill-holes remained where there had been a bronze plate. Marauders had ravished the tribute either to pawn the metal or to keep it as a souvenir.

A few days later in the square at Ashland, Ohio, I bared my head before another monument to Johnny, which had been erected by the contributions of reverent school children. Flowers smiled brightly around the well-kept base of the stone.

It seems to me that Leominster might well take a leaf out of Ashland's book. If the original Chapman homestead were still in existence, an identifying tablet would be in order. Since this is not the case, why not forsake exactitude and place the memorial in the most attractive spot in town—either at a public square or on a commanding orchard hillside?

Apple Bloom Is a Deep Memory I SWUNG down to St. Louis particularly to meet Edgar Anderson, director of the Missouri Botanical Garden. His recent book, *Plants, Man and Life*, throws much new light on the great antiquity of horticulture.

"I have been conducting a little experiment," he said, "on your idea that fruit blossoms stir our deepest memories. I have taken pains to raise the question scientifically with quite a number of people: 'Do apple blossoms thrill you more than flowers which have no relation to food?' A sizable majority have assured me that they do."

That was worth the trip. It gives the psychological base to the appeal of our orchard blossom tours.

Fire in the Coal Hod TO Mrs. Eva C. Couch of Lynn, Mass., goes our prize this month for the best safety story. She reports:

"I was cleaning spinach in our kitchen downstairs when I heard a sort of crackling noise upstairs.

"Up I jumped, the spinach and knife landing on the floor. I ran up the stairs. In the coal hod three or four long pieces of moulding were on fire halfway to the ceiling.

"I called to a man in the yard who was walking around his garden. He came up and we put the fire out. If I had not been home that Sunday morning, the fire would have gone up through the roof. Someone had emptied his pipe into the coal hod."

Alfred Knebel, who contributed an article on pears to this column last October, is embarrassed. Will the Missouri reader who sent him money for scions kindly forward his address to Mr. Knebel, 1707 Empire Blvd., Webster, N. Y.

What Report on Pick-Your-Own? WITH another harvest completed, we would like to get information from those hardy growers who invite the public to come and pick their own. Send us a letter about your experience. A windfall for the best!

Address your "Windfalls" contributions to Henry Bailey Stevens, AMERICAN FRUIT GROWER, Willoughby, Ohio.

Photo courtesy Wenatchee Daily World

Cherries packed in lugs with polyethylene liners found widespread use among Washington shippers. This is pack of Fruit Growers Service, Wenatchee.

FILM LINERS For Cherry Lugs

New practice cuts decay losses, wins praise of shippers and trade

POLYETHYLENE liners for cherry lugs were used by nearly 100% of Yakima and Wenatchee shippers this year with good results.

Pioneered two years ago by Fruit Growers Service, of Wenatchee, and used experimentally last year, the poly liners came of age this year. As Guy Coe, of Fruit Growers Service, summed up the general attitude, "There's no question that poly or some form of it will be universal in cherries from now on."

Cracking was a big problem this year, and unavoidably some cracked cherries got into the boxes. But the polyethylene liners wiped out the decay threat. One New York broker reported, "The cherries this year have come in in much better condition than any other year."

In experiments with the poly liners at the USDA lab in Wenatchee last year, it was found that sealed polyethylene can be used as a liner for cherries during extended storage at 31° and 36° F.

The researchers also found that the film liner had to be perforated as soon as the lug was removed to room temperature, so as not to impair flavor. Shippers took special care to inform receivers of this fact, and there was no trouble from failure to puncture the liners. Most receivers were accustomed to punching film liners through previous experience with pears in liners.

Blue Ribbon Growers, of Yakima, used it for all their cherries this year. Manager Noel Bakke reported, "We had no mold whatsoever." THE END.

FOUR NORTHWEST MEETINGS

Oregon State Horticultural Society's 71st annual meeting, at Oregon State College, Corvallis . . . December 6-7.

Idaho State Horticultural Society's 62nd annual meeting, at Boise . . . December 7-8.

Washington State Horticultural Association's 52nd annual convention, at Yakima . . . December 10-12.

Utah State Horticultural Society's two-day annual meeting, at Salt Lake City . . . December 14-15.

APPALACHIA

(*Continued from page* 15)

Ridge mountains induce the desirable air drainage.

Appalachia is truly the land of big orchards. We have in the 4-state Belt a dozen apple growers with 1000 or more acres, each producing normal crops of a quarter million bushels or more. Biggest of these is the Byrd family—Senator Harry, his brother Tom, and the senator's three sons. With almost 5000 acres scattered wisely in 11 orchards over four counties, they have now a normal production close to 1½ million bushels and growing rapidly, as their orcards average 18 years of age. They have the world's largest one-field apple orchard—1200 acres in one planting at Charles Town, W. Va. A 200-acre grower here usually refers to himself as "just a little grower." But there are in the 4-state Belt some 2000 apple growers in the "commercial" classification, so we have hundreds with 10 to 100 acres.

The York Imperial is the Belt's biggest-volume variety, averaging about 5 million bushels or one-fourth our crop. Stayman — not Stayman Winesap—is second in volume or about 3 million bushels. Delicious is the Belt's third variety, volume-wise. It has recently passed Winesap and is gaining fast; but we still average over 2 million bushels of that fine "Old Virginia" Winesap. Rome Beauty ranks fifth, and Jonathan, Golden Delicious, Grimes Golden, Black Twig, Lowry, and Albemarle (Eastern Newtown) Pippin come along in about that order, with odd lots of dozens of others.

In summer apples, Transparent is giving way to Lodi, and some promising new red summer apples seem to be developing. Plantings for the past 15 years have been almost wholly in the "red sports" of the red varieties, and color, formerly one of the Belt's acute marketing problems, is less so.

Big Processing Plants

The world's biggest apple processing plants are in Appalachia, including two that each use 3 or 4 million bushels per season. The Belt's processors put up about 60% of the U. S. pack of apple sauce and slices; are now using about half the Belt's apples (average crop 20 million bushels), all the sour cherries, and some of the peaches. The plants have grown big because they are in the center of the supplies they want —mainly York Imperial apples. The York, discovered near York, Pa., in 1820, keeps in good condition long and holds its flavor and texture under heat beautifully. Appalachia grows 96% of all the Yorks grown in the U.S.

The Stayman is another favorite with processors, especially the quick-freeze people. It is also the preferred apple for eating out-of-hand by most of the apple people of the Belt. We call it "an apple man's apple." As with Yorks, this Belt is the Stayman stronghold. We grow two-thirds of the nation's crop.

In peaches, the reign of the Elberta is definitely over. Growers are branching out into a wide range of the newer varieties, to lengthen the marketing season. Hydrocoolers are appearing now in orchard after orchard. There is a real effort to supply the retailer with ripe, flavorful peaches.

Supplemental Irrigation

More and more, Appalachian growers are turning to irrigation, mostly in a supplemental way. With peaches it insures that last swell that adds the profitable extra quarter-inch in circumference. In apples, it is for a couple of extra acre-inches for special blocks during the hot, dry, July-August period.

A pronounced trend over the Belt is toward larger orchards. In Appalachia, under today's complexities in growing clean fruit, the necessary investment in equipment, materials, and trained help automatically requires an acreage larger than in the old lime sulfur days. THE END.

FRUIT VENDING MACHINES

This apple vending machine on the Cornell University campus grossed $3815 in 45 weeks. Students had choice of Cortland, Golden Delicious, Red Delicious, or McIntosh—all cold and crisp. According to a Cornell study made by Dana G. Dalrymple under the supervision of Prof. Max E. Brunk, the fruit vending industry is growing steadily. Sales from the nearly 1000 machines now in operation in the U.S. are good compared to other types of vending machines. Apples are the leading fruit sold, followed by pears and peaches. Standard price is 10 cents. Best locations are high schools, followed by colleges, military camps, factories, and transportation terminals. Selective model machines selling more than one kind of fruit cost about $947 and the non-selective models, $790.

Concluded Dalrymple: "Fruit vending machines are a relatively high-cost method of distribution requiring high gross sales per machine. They are not a panacea for the fruit industry's ills, but provide an important bonus outlet in stimulating fruit sales."

GAS FUMES KILL MICE

Too many mice in your storage? Try British Columbia's remedy

By S. W. PORRITT

Canada Department of Agriculture

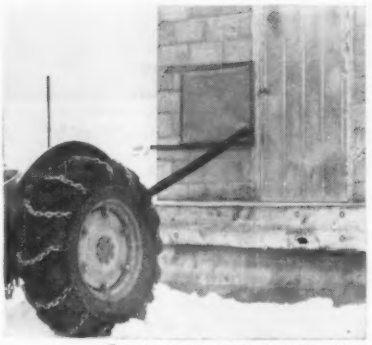
DURING the 1948-49 season in British Columbia's Okanagan Valley, meadow mice and deer mice appeared in epidemic proportions in the orchards. They entered the storages with the fruit in such numbers as to be seen tumbling onto sorting tables with the apples.

Trapping and poison bait had little effect. It was decided to fumigate the storages with carbon monoxide produced by gasoline engine exhaust. Storage doors and ports were closed and those that did not fit tightly were covered with two thicknesses of car liner paper secured with laths and nailing. Live mice in cages were placed near several ports or doors where they could be observed periodically to determine the progress of the fumigation.

Use Tractor Exhaust

The exhaust from tractors or trucks located outside the storage was piped into the central air distribution fan room or into any convenient port and was soon well-distributed throughout the storage. The air circulating fans were operating during the treatment.

The operation proved highly successful. Mice were killed in an 85,000 cubic foot storage in two hours by exhaust gas from one 60 h.p. tractor. The largest storage, 680,000 cubic feet, was successfully fumigated in five hours using four 60 h.p. tractors.



Canada Dept. of Agriculture Photo

Tractor exhaust fumes being piped into a British Columbia storage to control rodent infestation.

Carbon monoxide content of exhaust gas from gasoline engines may vary from 1 to 15%, but on an average is produced at the rate of about 2 cubic feet of carbon monoxide per minute per 20 horsepower. From actual tests it appeared that an exposure of four hours to exhaust from a 60 h.p. engine per 100,000 cubic feet of storage was adequate to kill all mice.

Following fumigation the storages were promptly and thoroughly ventilated. In plants equipped with central air distribution this was readily accomplished by opening all storage doors, opening an outside door to the fan room, and closing the return air openings from the storage.

This highly effective method of fumigation may seem simple, but should be attended with every precaution given any other fumigation procedure. Carbon monoxide is highly toxic to animals and human beings. Exposure to 1% carbon monoxide for five minutes during exercise or fifteen minutes at rest causes severe headache, mental confusion and collapse.

Chemical tests indicated that meadow mice were killed within three hours by exposure to .07% carbon monoxide at 32° F. At room temperature, however, about double this concentration was required. The regular organic-type canister respirator which is effective against fumigants such as methyl bromide offers no protection against carbon monoxide.

In addition to various odorous constituents, exhaust gas contains ethylene which under certain conditions accelerates ripening of apples. Brief exposure to low concentrations of ethylene at 32° F., however, has no detectable effect on ripening. After aeration there was no trace of exhaust fumes in the air or on the fruit. THE END

HIGH WINDS IN DWARF ORCHARD

High winds on August 18 did considerable damage at the *American Fruit Grower* experimental orchard. Shown above is a 4-year-old McIntosh on Malling VII which was blown over. Other 3- and 4-year-old trees were blown over, and several trees were wrenched out of the ground and blown away. In the semi-dwarf orchard on Malling VII stock, a liberal hay mulch was applied and this, together with heavy rains, made the soil soft and loose, making it easier for the winds to do their damage. Those trees not broken off at ground level were easily pulled back up and staked with apparently few ill effects.—R. T. Meister.

OPPORTUNITY ADS

Only 25c a word for one-time insertion; 20c a word for two-time insertion; 15c a word for four-time insertion—CASH WITH ORDER. Count each initial and whole number as one word. Copy must be in the first of the month preceding date of issue. Address: AMERICAN FRUIT GROWER, Willoughby, Ohio.

AGENTS WANTED

CLEANS WINDOWS WITHOUT MESS. Strange "dry" cleaning cloth. Replaces liquids. Windows gleam. Samples sent on trial. KRISTEE CO., DEPT. 104, Akron 8, Ohio.

BOOKS

"HOW TO BREAK AND TRAIN HORSES"—A book every farmer and horseman should have. It is free; no obligation. Simply address BEERY SCHOOL OF HORSEMANSHIP, Dept. 13811, Pleasant Hill, Ohio.

112 ILLUSTRATED PAGES OF DOWN TO earth strawberry know-how with complete charts on diseases, pests and their control. $1.50. AMERICAN FRUIT GROWER, Box 159, Willoughby, Ohio.

BOOK BARGAINS! SEND FOR LIST! BOOKSHOP, 6494 Aylesworth, Cleveland 30, Ohio.

BERRY BOOK: "THIRTY YEARS OF BERries." Raspberries and Strawberries. 84 pages, price $1.00 P'paid. ROY TURNER, 1525 S. Livingston St., Peoria, Ill.

MORE FRUIT, BETTER FRUIT, KEEP your own bees. You can do it. "ADVENTURES IN BEEKEEPING." $2.00. ROBERT OGLESBY, Route No. 1, Middletown, Ohio.

FOR SALE—EQUIPMENT & SUPPLIES

BUY SURPLUS DIRECT FROM GOVERNment at tremendous savings, farm tools, machinery, truck, jeep, tractor, power units, hundreds others listed in our bulletin. Price $1.00. GOVERNMENT SURPLUS SALES, Box 169ARG, East Hartford 8, Conn.

CIDER & WINE PRESSES, HAND AND HYdraulic, new and rebuilt. Repairs and supplies, clarifiers and filters, pasteurizers and bottling equipment. Write for supply catalogue. W. G. RUNKLES' MACHINERY CO., 185 Oakland St., Trenton, N.J.

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GOOD USED FARM CONTAINERS—SPLINT handle baskets, bushels, boxes, hampers, bags, nailed and wirebound crates. Truckload or carlots. Call or write ZELVY BROS. CONTAINER CO., 2005 Orange Ave., Cleveland, Ohio.

GRADING MACHINE CUTTER—USED—double roll table—four sizes, capacity 400 bushels per day, $195.00. S. B. CROWELL, JR., Edgemont, Delaware County, Pennsylvania.

1955 MODEL 36 BEAN SPEED SPRAYER. 1953 Model 36 Bean speed sprayer, Bean Model 48, Speedaire, Rolomulcher, Grader. CORY ORCHARDS, Cory, Indiana.

SPRAY MACHINE FRIEND NX PUMP 18 GPM VE-4 22 HP Wisconsin engine 300 gal tank with big Bes-Blower TF 15 HP Wisconsin engine 36" wheels used less than 75 hours NICHOLSON 2805 West 93rd, Kansas City, Missouri.

FOR SALE—REAL ESTATE

SAVE. BUY DIRECT FROM GOVERNMENT. Surplus farms, land, homes, etc. Listings $1.00. BUREAU BOX, 169AMG, East Hartford 8, Conn.

HELP WANTED—MALE

IF YOU ARE EXPERIENCED IN ORCHARD care and management and are willing to assume responsibilities, we have a position to start as a working foreman with excellent opportunity for advancement, good salary, living and working conditions. On progressive new commercial orchard in Upper Midwest. Write BOX 160, AMERICAN FRUIT GROWER, Willoughby, Ohio.

MANUFACTURERS AGENTS COVERING Orchard territory to set up dealers on power pruning equipment. JOHN BACON CORP., Gasport, New York.

MISCELLANEOUS

WHY HAVE GRAY HAIR? GUARANTEED liquid restores natural color in days. Six month supply $1.50 postpaid. FENDRICKS, 114 North Sixth Street, Allentown, Pennsylvania.

LATEST WALNUT CRACKER. DIRECT from manufacturer. BENN THOMPSON, Harrisonburg, Virginia.

MAILING LISTS—100,000 CAREFULLY SElected names in the Agricultural Field. Individual lists of Potato Growers, Tomato Growers, Corn Growers and many others. Ideal for firms wishing to contact leading growers and dealers. For details write: MACFARLAND CO., Box 5, 8 Elm St., Westfield, N.J.

PECANS—NEW CROP—U.S. # 1—UNshelled or meats—Cater to Roadside Stands—Priced and packaged for quick resale. Individual orders filled. B & B PECAN CO., Route 1, Box 232, Fairhope, Alabama.

BUILDINGS — PRE-FAB, COMBINATION steel and wood. Clear span widths of 20, 24, 30, 40, 50, 60 foot. Every detail simplified to insure easy erection. Farm, commercial or industrial use. Write for prices. Give approximate size. WAYNE R. WYANT, representative, New Bethlehem, Pa.

BOOTS — HIGHGRADE FANCY WESTERN style made to measure—catalog. CRICHET BOOT COMPANY, El Paso, Texas.

OF INTEREST TO WOMEN

EARN $50.00 FAST SEWING OUR PRECUT products. Information 3c. THOMPSON'S, Logansville 41, Wisconsin.

STEAM COOKER, NEW MODEL, COOKS entire nutritious thrifty meals on single burner. Recommended by Food Experts. Vitamins, flavors, juices don't boil away. Popular medium size 13 quart capacity four section Steamer only $9.50. For other sizes and more details write to: CLIMAX CORP., 50 Broad Street, New York 4, N.Y.

100 SPOOLS OF THREAD $1.00. 90 different colors. CONNECTICUT THREAD PRODUCTS, 131 Greenwood St., Dept. 1-A, East Hartford 8, Conn.

ORCHARD FOR SALE

500 APPLE TREES—7-ROOM CAPE COD house—Full bath—hardwood floors—2 car garage—barn—Orchard equipment—Box 164, Yarmouth, Maine.

60 ACRES. 27 ACRES APPLES, 16 ACRES grapes. Modern house and cold storage. C. E. SCOULLER, R.D. No. 4, North East, Pa.

400 ACRES—110 IN APPLES AND PEACHES—balance in timber. Fine condition, with all necessary equipment for growing apples and making apple-butter and cider. 5 room house with 5 tenant houses. 18,000 bu. storage and saw mill. A complete set-up, in Southern Ohio. Write CARL R. CORNUELLE, 3637 Tamarack, Cincinnati 7, Ohio.

SITUATIONS WANTED

APPLE ORCHARD MANAGER. EXPERIenced, college education. Seeks managers position. Good references. Box 161, AMERICAN FRUIT GROWER, Willoughby, Ohio.

TRADE MARKS

NATIONAL TRADE MARK COMPANY, Munsey Building, Washington 4, D.C.

This Beautiful, Imported, Handwoven

"HORN OF PLENTY"

Yours for Only $1

Brimming over with fruits, nuts and berries it makes a magnificent centerpiece. Filled with rolls and biscuits, it's a truly different bread basket.

Hanging on your wall it's a colorful flower vase. Quantities are limited. Order today.

American Fruit Grower, Willoughby, Ohio

STATE NEWS

(Continued from page 16)

Ton Per Acre

OREGON—A new organization, "Ton Per Acre Nut Club," sponsored by the Nut Growers Society of Oregon and Washington, is designed to help orchardists lower the cost of nut production. Objectives listed are: "Foster, encourage and call attention to those practices that will increase production per acre and promote the general welfare of the walnut and filbert industries in Oregon, Washington, and British Columbia."

Northwest nut growers are aware of facing stiff competition from imported nuts, and increased yields per acre that would lower the cost of production would help them stay in this highly competitive market.

To be eligible for the club, a nut grower must have at least 5 acres of walnuts, filberts, a combination of the two, or the same acreage in nut trees planted among other tree crops. Yields must be reported for the entire nut-bearing acreage on the grower's farm. Application for membership closes November 20.—*Harold and Lillie Larsen.*

Gardner Steps Down

NORTH CAROLINA—Prof. M. E. Gardner, veteran member of the North Carolina State College faculty, relinquished his duties as head of the college's horticulture department, at his own request, on October 1. He will devote his time to teaching and research at the college. Dr. Fred C. Cochran of the college faculty has succeeded him.

Gardner

Cochran

Under Prof. Gardner's leadership the department's staff has increased from 11 to 43 persons, and from one administrative unit to five sections—fruit crops, vegetable crops, floriculture and ornamental horticulture, fruit and vegetable processing, and extension.

Prof. Gardner has been instrumental in the organization and operation of a number of state grower associations, including apple, peach and blueberry growers.

Dr. Cochran, a member of the college faculty for the past eight years, is internationally known for his work in vegetable crops and plant breeding.—*Melvin H. Kolbe, Raleigh.*

Co-ops May Merge

CALIFORNIA—The Sebastopol Apple Growers' Union, the oldest co-operative in the apple industry and one of the largest, and the Sebastopol Co-operative Cannery, the largest cannery on the West Coast, are considering the possibilities of a merger.

SAGU operates a cannery and a fresh fruit packing house.—*Neale Leslie.*

The Murphy Ranch Company packing house at Whittier will close after 41 years of continuous operation packing out Sunkist citrus fruit. Murphy Ranch will continue to grow fruit but will ship it through another Sunkist packing house. This will also mark the end of the Whittier District Fruit Exchange, founded in 1921.

Whittier, a Quaker college town and home of Vice-President Nixon, is located about 14 miles from Los Angeles. At one time it was in the midst of orange and lemon groves; today, it is surrounded by real estate subdivisions.—*Marian M. Finney.*

MY OWN COLD STORAGE

(*Continued from page* 11)

weather, and if they couldn't be sold almost the day they were picked, we lost them. With the cold storage and special racks we made with pallets, I have been able to handle even the fastest-moving peach deal.

With regard to mouse control, I had taken some serious losses in commercial storages. Part of this probably was my fault, but not all. During the past two seasons, my mouse damage in storage has been practically nothing.

I bait the loads with poisoned cracked corn as they come in, and try not to leave boxes of fruit in the orchards overnight. Constant baiting in the storage during the winter with fresh bait kills the occasional mice that get in.

Some fruit growers complain of excessive shrinkage in storage. This is because the humidity is not high enough. I am very particular about this. The floor and boxes are hosed down with 25 to 50 gallons of water each day when filling the storage with apples, and quite often thereafter.

I do everything possible to prevent scald. I allow for complete ventilation by stacking 6 inches from the walls. Storing with field crates on pallets allows further ventilation. In addition I filter the air with activated charcoal filters which are a big help in preventing scald.

I try to harvest my scald-susceptible varieties such as Greenings and Cortlands when not too green nor too ripe and get them into storage as soon as possible after picking.

The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks **is the title of Agricultural Hand Book No. 66 of the USDA. Invaluable information for all growers of fruits and vegetables is the table in the Hand Book on recommended temperature, relative humidity, and approximate length of storage period for the commercial storage of fresh, dried, and frozen fruits; nuts; fresh, dried, and frozen vegetables; vegetable seeds; and the average freezing points of these commodities. Copies of the Hand Book are available for 30 cents (in coin) from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.**

One great advantage of a private storage is that we can keep things under our finger. We can work any time of the day or night. We can shift lots around if necessary without incurring the wrath of a storage operator. We can handle the fruit with almost no bruising. Crates are seldom broken. Bruised or overripe lots of apples in a room tend to ripen the other lots. What can you do about this in a storage you do not own? Nothing. In our own storage we can prevent such situations.

Every advantage which I had listed before I built my storage has worked out to my satisfaction. I like the pallet system of handling fruit.

Were I to build my storage over again, there are very few changes that I'd make. Perhaps I calculated the size of the lift truck and doors too closely. Also, I have had some difficulty with my outside concrete floor platform which we added later. It was built a little too high to allow ample door clearance. It is difficult to grind down cement once it gets hard, so it is important to test all storage doors by swinging them before the cement hardens, making allowance for any chance ice or snow coating. Advance checking on the most advantageous side for opening the doors is important, especially if arrangement of a sales or packing room is involved.

I feel that the brine diffuser was an excellent choice to solve the defrosting problem. I believe that I hit upon a very economical and efficient insulation in the shredded redwood bark. With constant bumping and rubbing of the walls with the truck lift, I'm glad I have the firm redwood siding.

To keep fruit well in a farm cold storage, you must pay close attention to the many details. The storage will not take care of itself, even though almost everything can be made automatic.

However, I've found it is possible to leave the farm for a few days at a time, by having a good friend with a similar storage check mine along with his. Also it helps to have a son who knows the details of operation; especially one who checks up on what his dad sometimes misses. I am very fortunate in this regard. THE END.

THE GOODRICH COLD STORAGE

The Goodrich cold storage consists of a 10,000-bushel room plus a power room (with plans to add a 5000-bushel room and packing room later). The 30 x 60-foot concrete block storage is about 16 feet high from the floor to bar joists supporting the ceiling. There are no posts inside the building, as it was designed for pallets and a fork-lift truck.

The floor consists of two reinforced 3-inch concrete slabs, with 3 inches of Fiberglas block insulation between them. Hot asphalt was placed under the floor insulation. Below the floor is one foot of gravel fill.

The asphalt-coated roof is practically flat, with 8 inches of Palco Wool insulation (shredded redwood bark treated for fire resistance). For added insulation, the top was coated with aluminum paint.

On the inside walls, the concrete blocks were given a vapor seal consisting of two coats of special asphalt paint. Side walls have 6 inches of Palco Wool insulation.

Matched 6-inch redwood siding was used inside to hold the loose-fill Palco wool insulation, with galvanized nails to secure it. Rewood and its bark are highly resistant to decay and vermin.

The Carrier refrigeration equipment consists of a large brine coil cold air diffuser with duct work over the center aisle at the ceiling.

The power room is a 20 x 20-foot addition to the main building, and includes a small office, workshop, and two toilet rooms. About 12 feet high, it houses the compressor, automatic switches, electrical circuits, and the water pump which supplies water to the evaporator condenser outside the building.

American Fruit Grower

• Fruit for Health •

RICHARD T. MEISTER, *Editor*
H. B. TUKEY, *Associate Editor*

A Name for Baby

SINCE the principle of controlled atmosphere storage was developed by Drs. Franklin Kidd and Cyril West in England in the 1920's, it has had more changes of name than a Hollywood actress.

Drs. Kidd and West called their brainchild "gas storage," but that term didn't click with American apple eaters. Early consumer resistance forced Vermont growers to explain to people over the radio that they wouldn't get sick from eating apples "stored in gas."

Realizing that the term "gas" implied too many unpleasant and even dangerous things, it was decided to give the baby a new name. Prof. Frank Allen, of the University of California, who introduced the method into this country in 1934, suggested "carbon dioxide storage." But the name that was most widely used during its early commercial development in this country was "modified atmosphere storage" or "modified air storage."

Then a Canadian horticulturist, W. R. Phillips, started calling it "controlled atmosphere storage" in 1938, and by 1941 this term was being generally used in the United States.

But, complains Dr. Bob Smock, who wrote the article on controlled atmosphere storage in this issue, "That's quite a mouthful! A short, snappy name that accurately explains the storage would do a lot to help acceptance by the consuming public."

Some advertisers use the name "sleeping apples," but we wonder if that name will have much mass appeal.

Perhaps "controlled atmosphere" isn't such a bad name, after all. Are we not entering the atomic age when the thoughts of people are being lifted from the earth to the skies and atmosphere? Are we not rearing children who know more about space helmets and rocket ships than we ever dreamed of? We have a sneaking hunch that in the new scientific age, the term "controlled atmosphere" may prove very popular.

A Horticulturist Abroad

NOW begins the long Pacific flight by daylight northward back over the equator from Indonesia, past Singapore and the Malay States, over a corner of Indo-China to Hong Kong in China. The sky and the sea are blue. The plane is air-conditioned. The food is excellent—oranges, Australian apples, and other fresh fruits.

Hong Kong, the Jewel of the Orient, is a rocky island 1000 feet in height which forms a protective harbor against the mainland of China. You buy mangoes and mangosteens and litchi at the fruit stores, and you return to your room to stuff yourself with these delightful tropical fruits. Japanese and Australian fruit can be found sparingly, and also American oranges plainly marked.

The flight into Manila is through a violent tropical storm with sheets of water and a terrific electrical display. Now the temperature and humidity are high, but now for the first time in weeks you can brush your teeth with water from the tap, and a radio blares, "Rooster, Rooster, Rooster Coffee!" Shades of the good old USA!

Thirty miles south of Manila is Los Banos and the well-known agricultural college, where Cornell University maintains a visiting staff represented among others by Drs. Everett, York, and Von Oppenfeld, working in crop improvement and economics.

Sugar cane, bananas, coffee, chocolate, tobacco, pineapple, citrus, and many vegetable crops grow well. Horticulture is still a branch of "agronomy" here, but it is coming ahead in its own right, as it is in all parts of the world.

North a few hours, with a stop at the island of Okinawa, where horticulturist R. F. Carlson, of Michigan State University, is stationed. Then on to Tokyo to be welcomed royally by flashing cameras, television, radio and the press.

On islands which together are the size of California live 90 million people, averaging 2½ acres per family. Every acre of productive land taken over by industry or the military adds to the problem. Japan is by far the most highly developed country in the Orient—with modern buildings, transportation, communications, refrigeration, and all that goes with modern living.

While fruits are not in excess, they are more accessible here than anywhere else in the Orient. Oranges cover 119,000 acres, apples 116,000, grapes 13,000, peaches 2500, and pears 2000 acres. The leading apple (40% of the acreage) is the old American variety, Ralls Janet. Other varieties are Jonathan, 20%, Delicious, 15%, and Golden Delicious, 5%. Trees must be wired branch by branch to wire trellises to withstand the typhoons that menace the area.

The Delaware and Campbell grapes, the Napoleon cherry, and the Marshall strawberry are found. A huge, long, cylindrical forcing strawberry called Fukubu is especially esteemed. Tiers of strawberry plants in terraces are one of the wonders of Japan.

Just north of Tokyo the U.S. Army maintains a tremendous hydroponic installation, with horticulturist R. E. Culbertson in charge. Here vegetables are grown in water, without benefit or need of soil, to feed the American military personnel in Japan.

Southwest of Tokyo is the horticultural station directed by able and cordial Dr. Minoru Kajiura. A true dwarf peach tree 24 inches tall stands outside the door.

The produce markets feature fine-quality fruit in a multitude of intricate, homemade containers. The Japan Fruit Growers Co-operative, handles 60% of the commercial fruit crop, explains General Manager Takahashi.

Now comes the good-by to many friends, including Dr. Morinaga of the Science Council and Dr. Asami of Tokyo University. The night flight carries us to Wake Island, and late afternoon finds us in Hawaii.

Dr. W. A. Aldrich comes over from Lanai where he manages 15,000 acres of pineapple, the most mechanized fruit crop in the world. The thrill of American soil underfoot is beyond description. And when another night brings the big plane back to the mainland in California, the realization of what "home" means really dawns full upon us.

Strawberries, oranges, apples, pears, plums, apricots—fruits and vegetables in abundance. People well and happy and industrious, thinking instinctively in terms of co-operation. A land where a man has the opportunity to become what he wants if he is willing to work hard enough for it.

What a land is this America of ours, which too few of us fully understand and appreciate. You resolve in your own small way to guard her and to serve her with all you possess. And you also earnestly resolve that the next time you hear anyone in America complaining, you will just shrug your shoulders and say, "Poor fellow, guess he hasn't been around much!"

—*H.B.T.*

This is the fourth and final report from our associate editor, Dr. H. B. Tukey, on his trip to southeast Asia for the Atomic Energy Commission.

Fruit Growing is Such Fun!

Coming Next Month

- Is Diversification the Answer?
- Dwarf Apple Trees in England
- Three Co-ops for Sperryville
- Stanley Prune Gains in Favor
- When to Prune Grapes

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